PHENOLIC COMPOUNDS OF Laserpitium latifolium

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Lasterpitium latifolium L. (fam. Apiaceae) has long been used as a diuretic, purgative, and tonic in stomach diseases, pulmonary tuberculosis, and fever; in gynecology; for treating the heart and liver and in rheumatism; and externally in toothache and puritic dermatomycoses; and also in brewing and veterinary medicine [1-3]. It is known that quercetin has been isolated from L. latifolium.

The leaves of Laserpitium latifolium gathered in the experimental plantation of the Central Botanical Garden of the Belarus Academy fo Sciences were extracted with 80% ethyl alcohol. The alcoholic extract was investigated for the presence of phenolic compounds by two-dimensional chromatography on Filtrak FN 12 paper. Individual compounds were obtained by the preparative paper chromatography of the alcoholic extracts in the following solvent systems: 1) butan-1-ol–acetic acid (glac.)–water (3:1:1); and 2) 15% acetic acid. The substances were eluted from the chromatograms and were purified on paper in system 2. The purified substances were dissolved in 96% ethyl alcohol and the solutions were used for the hydrolysis and identification of the phenolic compounds. As a result, eleven compounds (I-XI) were isolated.

The structures of the compounds isolated were determined with the aid of UV spectroscopy in 96% ethyl alcohol with diagnostoic reagents, from their mobilities on paper chromatography in polar and feebly polar solvent systems, by specific reactions, by the results of a study of the products of acid hydrolysis and chemical transformations, and by direct comparison with authentic samples of phenolic compounds [4-9].

The identification of the phenolic compounds with the aid of paper chromatography was also confirmed by HPLC. The analysis of alcoholic extracts from L. latifolium was carried out on a Waters liquid chromatograph (USA). The compounds were identified from their retention times on a Diasorb 130 C 16 T column (4 × 250 mm), using authentic samples. As the mobile phase we used a solution of acetonitrile in 1% acetic acid. Detection was carried out at a wavelength of 260 nm on a Lambda-MaX. Mod. 481 LC. spectrophotometer. The time of analysis was 30 min, the rate of flow being 1 ml/min [6, 9].

On the basis of the results obtained it was established that substance (I) was quercetin 3-O-arabinoside (avicularin); (II) quercetin 3-O-glucoside (isoquercitrin); (III) quercetin O-rhamnoside (quercitrin); (IV) quercetin 3-O-rutinoside (rutin); (V) kaempferol 3-O-glucoside (astragalin); (VI) 5'-caffeoylguinic (chlorogenic) acid; and (VII) 3'-caffeoylquinic (neochlorogenic) acid. Substances (VIII) and (IX) were quercetin derivatives, (X) an isorhamnetin derivative, and (XI) a kaempferol derivative, but it has not yet been possible to establish their structures definitively.

This is the first time that these known compounds have been isolated from Laserpitium latifolium.

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CAROTENOIDS OF LIPOKHROMIN

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At the present time, several natural preparations containing carotenoids are known: rose oil (60 mg %), Karotolin (120 mg %), sea buckthorn (180 mg %). In the All-Union Scientific-Research Institute for Drug Chemistry and Technology (Khar'kov) from the flesh of rose fruits, after the elimination of hydrophilic substances with the aid of ethylene chloride, we have obtained a native lipophilic complex containing up to 6-8 thousand mg of carotenoids per 100 g, and an oil concentrate containing 800-1000 mg of carotenoids, calculated as β-carotene per 100 g. They possess high antioxidant activity and are stable in the process of isolation and storage.

We have studied the carotenoid composition of an oil concentrate containing 867 mg of carotenoids per 100 g. The concentrate (5.4 g) was dissolved in 100 ml of diethyl ether and was saponified with 100 ml of a 20% alcoholic solution of sodium hydroxide at 40°C for 3 h. The saponified extract was washed with water until the alcohol and alkali had been completely removed. The carotenoid extract was dried with anhydrous sodium sulfate, the ether was distilled off under vacuum, and the dry residue was immediately transferred into gasoline (70 ml, bp 80-120°C), after which the carotenoids were separated and investigated.

For separation we used the methods of column and thin-layer chromatographies [1]. The carotenoids isolated in various solvents were investigated on spectrometers in the visible and ultraviolet regions of the spectrum. Quantitative measurements were made from the optial density of each carotenoid and its extinction taken from literature sources [1, 2]. The carotenoids were identified with the aid of the results of the spectroscopic investigations, their positions and colorations on chromatograms, qualitative color reactions, and the chromatography of mixed samples of the carotenoids under investigation with definite carotenoids isolated from carrots, squashes, and tomatoes. The results of the qualitative and quantitative studies of Lipokhromin are given below

Carotenoids	Amount, % on weight of carotenoids	Carotenoids	Amount, % on weight of carotenoids
Phytoene	-	β-Cryptoxanthin	27.18
α-Carotene isomer	0.03	Poly-cis-lycopene a	1.54
β-Carotene	14.96	Antheraxanthin	30.74
β-Zeacarotene	4.79	Poly-cis-lycopene b	0.34
α-Cryptoxanthin	0.11	Poly-cis-lycopene c	0.41
Unidentified	3.10	Taraxanthin	6.58
Prolycopene	10.22		100.00

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